Section 6 - 6

List of contents

1 What to do table 1
2 Adjustments 2
2.1 Installing thermal head data 2
2.1.1 Preparation of the TH-return procedure 3
2.2 Update BRAM 3
2.3 Adjustment of the eccentric drum 4
2.4 Adjustment of belt tension and belt tread of the main drive assembly 7
2.4.1 Belt tension of toothed belt 8
2.4.2 Belt tension of flat belt 8
2.4.3 Flat belt tension in machines with toothed belt tensioner 12
2.4.4 Flat belt guide 14
2.5 Horizontal and vertical film alignment 15
2.6 Changing the film size 19
2.7 Thermal head pressure adjustment 23
3 Calibrations 27
3.1 Overview of procedures and calibrations Rel. 1.7X 27
3.2 Overview of procedures and calibrations Rel. 1.9X 27
3.3 Overview of keypad and IMOS service software calibration menus in SW Rel. 1.7X and 1.9X 28
3.4 Registration Calibration 29
3.5 Reference Film Calibration 30
3.6 Density Meter Calibration 31
3.7 TH profile calibration 33
3.8 Maximum density calibration 34
3.8.1 Print SMPTE Testimage 35
3.9 Film Sensito Calibration 36

1 What to do table

Replacement	Adjustment / Calibration	Refer to
Thermal Head	(1) Installing thermal head data	2.1
	(2) Adjustment of the eccentric drum	2.3
	(3) Dmax calibration	3.5
	(4) Film sensito calibration	3.6
TH cam assembly	(1) TH pressure adjustment	2.7
Print Drum	(1) Adjustment of the eccentric drum	2.3
	(2) Belt tension and belt tread	2.4
Main drive assembly Drum motor	(1) Belt tension and belt tread	2.4
Film loading assembly	(1) Changing the film size*	2.6
	(2) Vertical alignment	2.5
Horizontal alignment assembly	(1) Horizontal alignment	2.5
Macrodensitometer	(1) Registration Calibration	3.1
	(2) Density Meter Calibration	3.3
Gemini CPU	(1) Update BRAM	2.2

*only in case 11x14" or 14x14" films are in use

2 Adjustments

2.1 Installing thermal head data

Please observe:
In following cases you will get 100% refund for returning a defective thermal head:

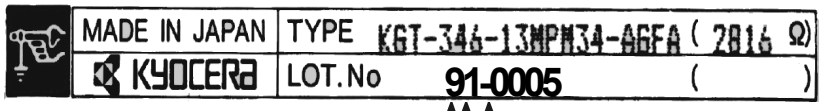
- in case of less than 15000 films printed with this TH. Refer to note 1.
- in case of less than 14 months since date of manufacturing of the TH. Refer to note 2.

Note 1:
The number of printed films can be seen in the infocounter (IMOS Drystar 3000: 'Repair' → 'Infocounter' → 'View Infocounters').

```
4.2 Component reliability:
-------------------------------
                      total:   date:
TH replaced:          12188    09-Apr-1998
```

In this example 12188 films were printed with the currently installed thermal head.

Note 2:
The date of manufacturing can be found on a label at the thermal head:



Date of manufacturing:
sequential number
Month (1 = Jan, 2 = Feb, ..., X = Oct., Y= Nov., Z = Dec.)
Year (last digit of the year)

In this example the thermal head was manufactured in January 99.

Required for the adjustment:
- IMOS Drystar 3000
- New and old TH floppy.

- Connect a service Notebook to the Drystar 3000 and switch it on
- Start IMOS Drystar 3000.
- Select REPAIR → PRINT ENGINE → MODULES → THERMAL HEAD.
- Click the INSTALL button and follow the instructions.

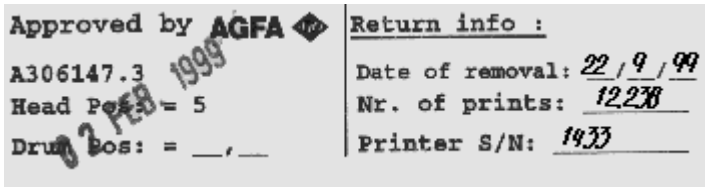
Note: In case the Thermal Head is less than 14 months old or printed less than 15.000 films, prepare the TH return procedure as described in 2.1.1.

- further adjustments and calibrations to be carried out as described in "What to do table" on page 1.

2.1.1 Preparation of the TH-return procedure

In case the following requirements are fulfilled 100% refund for the TH will be given:

1. The defective thermal head has been produced since less than 14 months or has printed less than 15.000 films (refer to 2.1)
2. The label on the TH is filled out.



3. A film with the image fault is enclosed
4. The original thermal head floppy is enclosed

Send the package with the thermal head (label filled out), film with image fault and original thermal head floppy to:

Agfa – Gevaert AG
LOG - TR
Tegernseer Landstraße 161
D-81539 München, Germany

2.2 Update BRAM

- Select in IMOS Drystar 3000: REPAIR → PRINT ENGINE → MODULES → BATTERY RAM.
- Click the UPDATE BRAM button.
- Follow the instructions.

2.3 Adjustment of the eccentric drum

Required tools:

- Service Notebook with IMOS Start and IMOS Drystar 3000 Software

> - All the adjustments of eccentric bearings must be made on **both** sides of the print drum.
> - In every process step two test films are made. For evaluation of the test results, however, only the second film is taken. The first film is only used for checking the stability of the printing process.
> - Print the test films via the Service Notebook (testfilm = further TF)

- Ensure that **both** eccentric bearings are in position "0"! (See Figure 1)

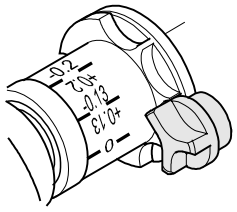
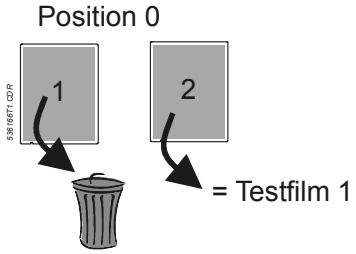
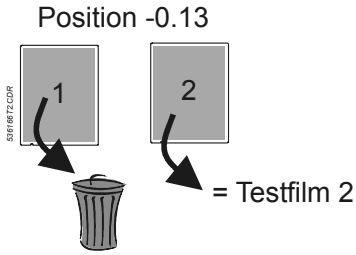


Figure 1

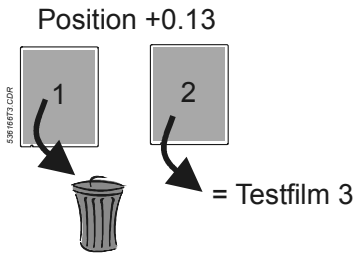
- Start the IMOS Service Software on the Service Notebook and produce 2 test films of the test image FLAT3002.bla by entering <Repair>, <Printengine>, <Print Test Image>.



- Adjust both eccentric bearings on position "**-0.13**".
- Make another 2 films of the test image FLAT3002.bla.

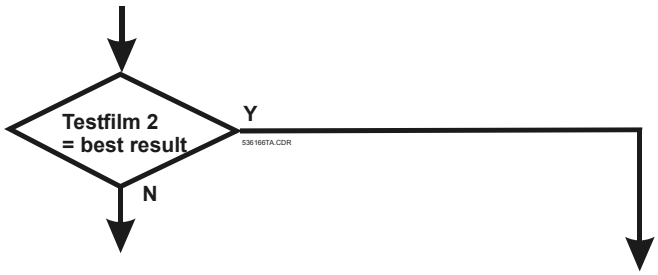


- Adjust both eccentric bearings on position "**+0.13**".
- Make another 2 films of the test image FLAT3002.bla



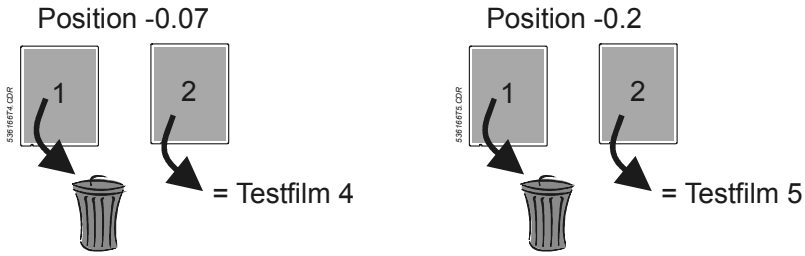
- Determine which test film (TF 1, TF 2, TF 3) has the least visible stripes and the darkest image impression.

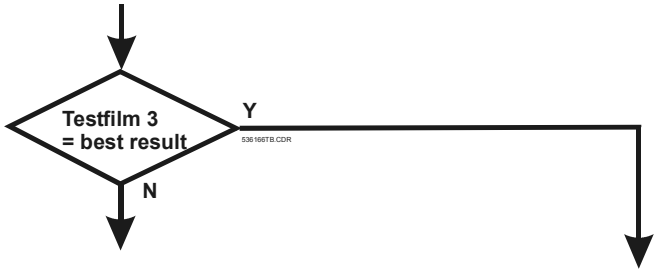
Homogeneity and highest density have equal priority criteria.
However, evaluation is always a subjective judgement, there are no defined values for evaluation.



- Set both eccentric bearings on the value "**-0.07**".
- Make another 2 films of the test image FLAT3002.bla

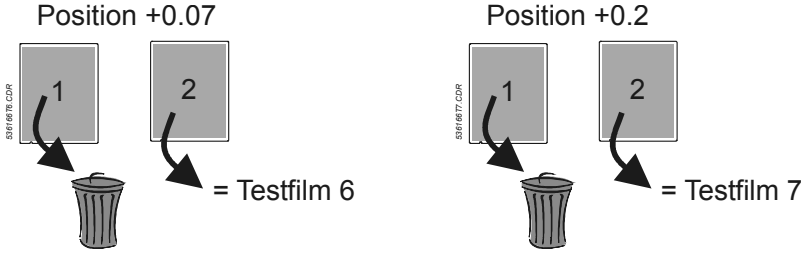
- Afterwards adjust the eccentric bearings on "**-0.2**“
- Make another 2 films of the test image FLAT3002.bla

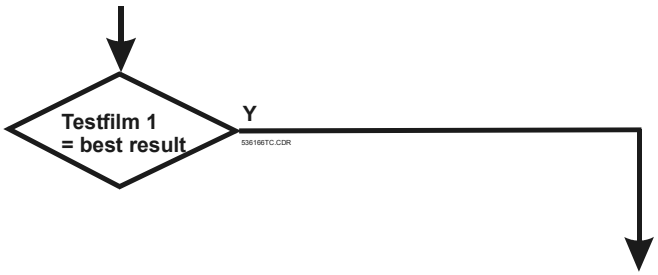




- Set both eccentric bearings on the value "**+0.07**".
- Make another 2 films of the test image FLAT3002.bla

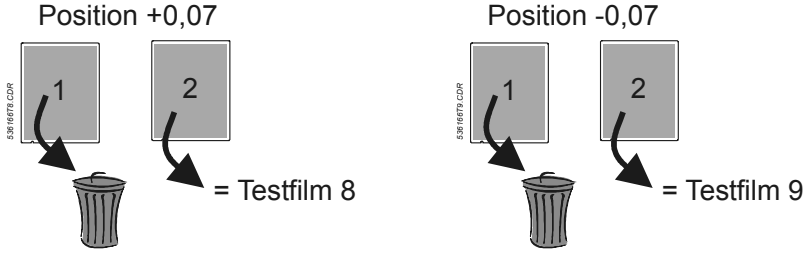
- Afterwards adjust the eccentric bearings on "**+0.2**“
- Make another 2 films of the test image FLAT3002.bla





- Set both eccentric bearings on the value "**+0.07**".
- Make another 2 films of the test image FLAT3002.bla

- Afterwards adjust eccentric bearings on "**-0.07**"
- Make another 2 films of the test image FLAT3002.bla



- Always depending on the best position compare:
  TF 4 and TF 5 with TF 2
  TF 6 and TF 7 with TF 3
  TF 8 and TF 9 with TF 1

- Adjust the eccentric drum according to the following table:

Best test film	Adjustment value for the eccentric drum
TF 1	0
TF 2	- 0.13
TF 3	+ 0.13
TF 4	- 0.07
TF 5	- 0.2
TF 6	+ 0.07
TF 7	+ 0.2
TF 8	+ 0.07
TF 9	- 0.07

- Note the adjustment value on the provided sticker on the thermal print head.
- Mount the right hand and left hand panels again.
- Now the modification is completed and the device is ready for operation.

2.4 Adjustment of belt tension and belt tread of the main drive assembly

After replacement of the drum, drum motor, worn belts or any other part of the main drive assembly it will be necessary to carry out the following adjustments:

Machine serial numbers	Adjustment	Description in chapter
5750, 5752, 5754 to 5761 ≥ 5763	• Flat belt tension • Flat belt running askew	• 2.4.3 • 2.4.4
< 5763 (except 5750, 5752, 5754 to 5761)	• Toothed belt tension • Flat belt tension • Flat belt running askew	• 2.4.1 • 2.4.2 • 2.4.4

The slightest modification of one of the three adjustments mentioned above will automatically influence the other two. As a consequence, it is recommended to re-check continuously the three adjustments when modifying one of them.

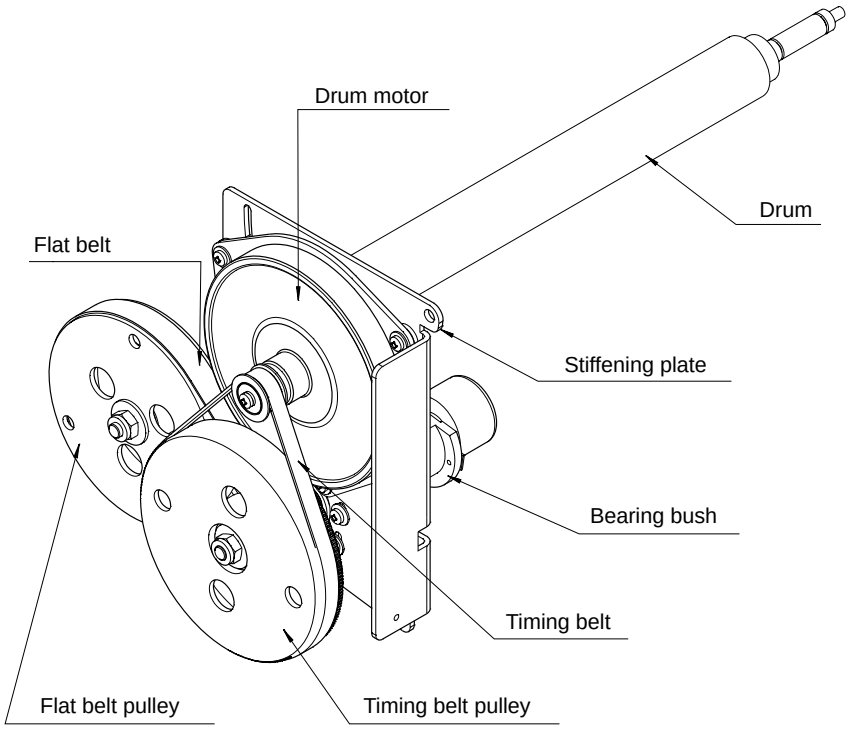


Figure 2

Tools needed to carry out the adjustments:

- crosshead screwdriver Philips size 2,
- special tool for carrying out the drum torque measurement,
- torque spanner with screw head size 13.

2.4.1 Belt tension of toothed belt

To carry out the adjustment, proceed as follows:

- loosen the 4 screws (see Figure 4) that fix the bearing bush to the stiffening plate as well as the locking screw (see Figure 3),

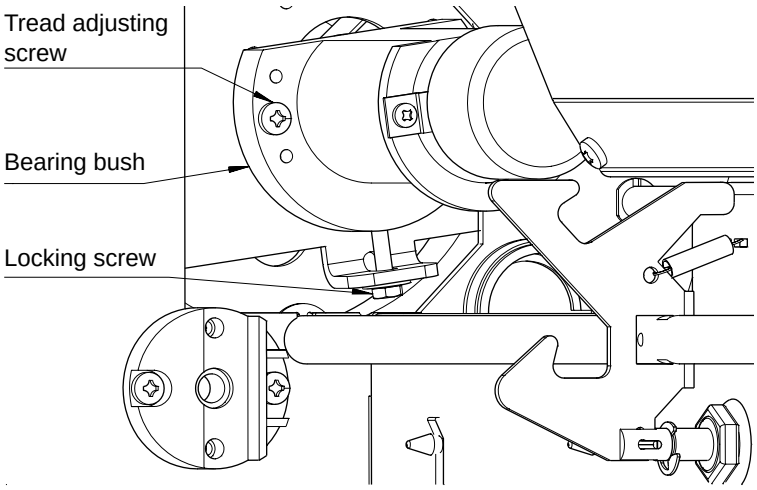


Figure 3

- press down slightly the timing belt pulley (see figure 2) with one hand, do not press too hard in order to avoid the belt tension of being too tight, approx. 1.3 kg,

Do not use a lever to press down the pulley.!

- with the other hand, tighten up the 4 screws of the bearing bush,
- screw tight the locking screw to the stiffening plate, but do not tighten too hard!

2.4.2 Belt tension of flat belt

Required tools:

- Service Notebook with IMOS Start 4.09 (or higher) and IMOS Drystar 3000 Software ≥ rev. 2.19.

Note: In case IMOS Drystar 3000 Software ≥ rev. 2.19 is not available (e.g. usage of IMOS Drystar 2.05) or the machine has device software < release 1.40 installed, refer to section 2.4.2.1 page 10.

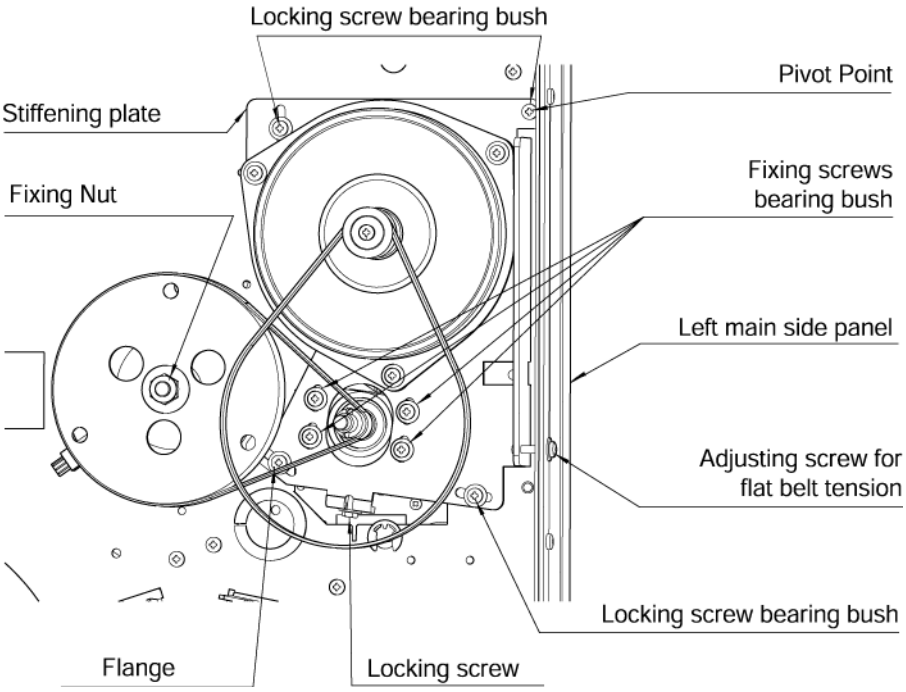


Figure 4

The flat belt tension can be adjusted by turning the reinforcement (stiffening plate) on which the intermediate shaft of the flat belt pulley is mounted. The stiffening plate can be turned around one of its fixing points (pivoting point) by loosening or tightening the adjusting screw (see Figure 4). (The toothed belt pulley is not shown.)

To carry out the adjustment, proceed as follows:

- loosen slightly the 4 screws fixing the stiffening plate just enough to allow the plate to pivot
- Start IMOS Drystar 3000 and connect to the printer. Select REPAIR → PRINT ENGINE → MODULES → DRUM.
- Perform a measurement of the torque of the drum motor to define the belt tension. To do so, block the turning of the drum pulley with a screw driver (see Figure 7) press on TORQUE. In the next window press on START (See Figure 6)
- Turn at the adjusting screw (clockwise corresponds to higher torque), until the value 2.40 ± 0.1 is reached. This value corresponds to the correct torque.

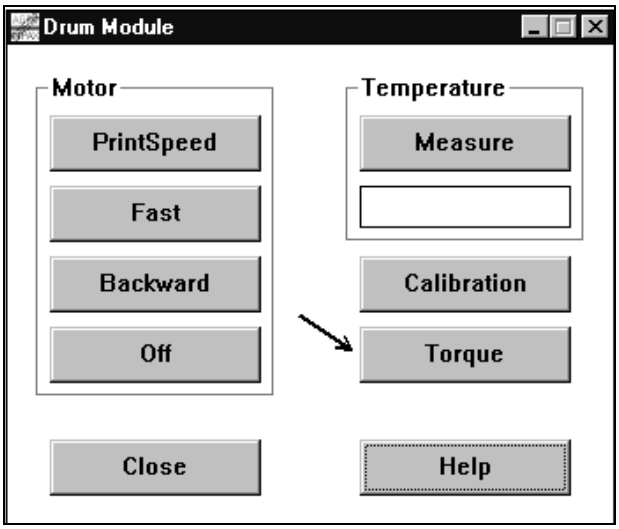


Figure 5

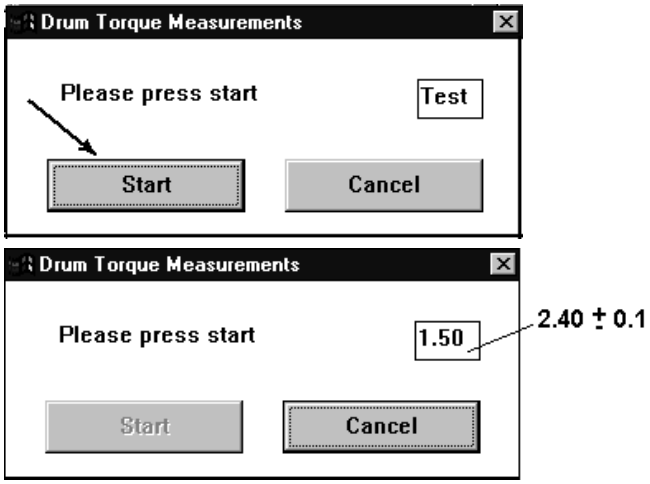


Figure 6

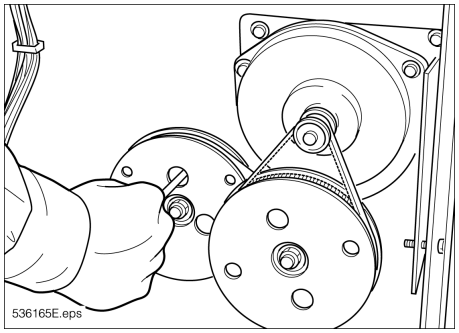


Figure 7

Note: Blocking the belt pulley by means of a screwdriver.

Avoid the motor to run for a longer period than 5 min. at such a low speed since the temperature of several electronic components on the PMC-print could become too high.

- Press cancel to leave the adjustment screen
- Tighten the 4 screws for fixing the stiffening plate

2.4.2.1 Adjustment with IMOS Drystar < 2.19 or device SW < rel. 1.40

- loosen slightly the 4 screws fixing the stiffening plate just enough to allow the plate to pivot
- Cut one of the wires of the drum motor and connect the wire again by putting a multimeter in between so that the current can be measured.
- Start IMOS Drystar 3000 and connect to the printer. Select TOOLS → TERMINAL
- Perform a measurement of the current of the drum motor to define the belt tension. To do so, start a terminal emulation session via IMOS → Tools → Terminal and type

  mon res <Enter>

  at message "AOS started" press <ENTER>

  T14 <CR>

  MS <CR> and wait until the message “Command terminated” is displayed. Then type

M1 <CR> (for activating the drum motor)

1 <CR> (for putting it on)

1 <CR> (for turning backwards)

500 (for a speed of 500μm/s)

DO NOT YET PUSH THE RETURN KEY.

- Block the drum pulley (see Figure 7) and press the RETURN key.
- Measure the current. It should be 2400 +/- 200 mA. If not in this range use the set screw of the driving assembly to adapt the current value: Turning clockwise corresponds to a higher current.
- Leave the T14 program (M1 <ENTER>; 0 <ENTER>, quit <ENTER>)
- Remove the multimeter.
- Solder the wire ends of the drum motor and isolate them with isolating tape
- Tighten the 4 screws for fixing the stiffening plate

.

2.4.3 Flat belt tension in machines with toothed belt tensioner

Required tools:

- Service Notebook with IMOS Start 4.09 (or higher) and IMOS Drystar 3000 Software ≥ Rev. 2.19.

The tension of the flat belt can be adjusted by turning the stiffening plate where the intermediate shaft of the flat belt pulley is connected. The stiffening plate can turned around one of its fixing points (pivoting point) by loosening or tightening the adjusting screw (see Figure 8). The toothed belt pulley is not shown.

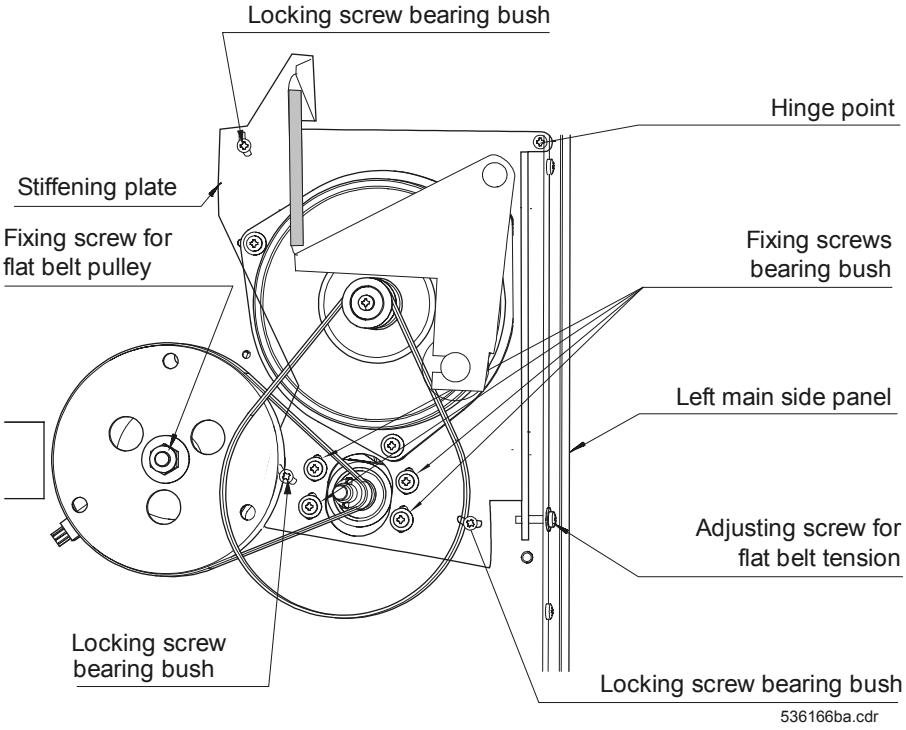


Figure 8

For the adjustment proceed as follows:

- Slacken the 4 screws fixing the stiffening plate ("locking screw bearing bush" and "hinge point") slightly, only until the plate is slightly loose.
- Start the IMOS Drystar 3000 and connect the Service Notebook with the printer. Activate the functions REPAIR → PRINT ENGINE → MODULES → DRUM.
- Measure the drum torque to define the belt tension. To do so, block the turning drum belt pulley with a screwdriver (see Figure 11)
- Press on TORQUE, and press on START in the next window (see Figure 10)
- Turn the adjusting screw (clockwise turning increases the torque), until the value 2.40 ± 0.1 is obtained. This value corresponds to the correct value.

The motor must not run for more than 5 min in this slow speed since otherwise the temperature of some electronic components on the PMC Board increases to far.

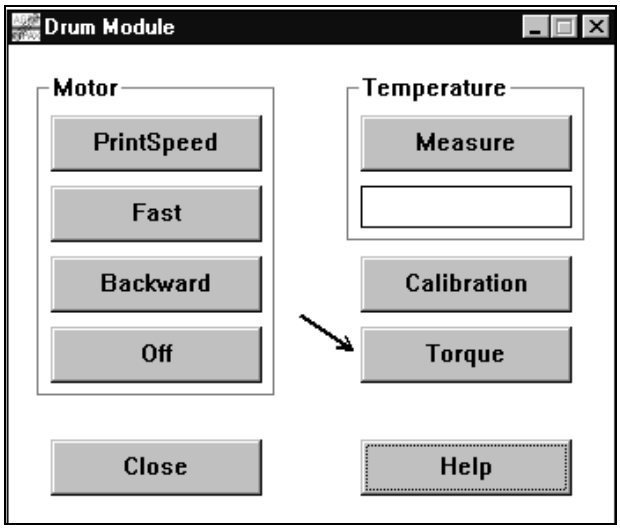


Figure 9

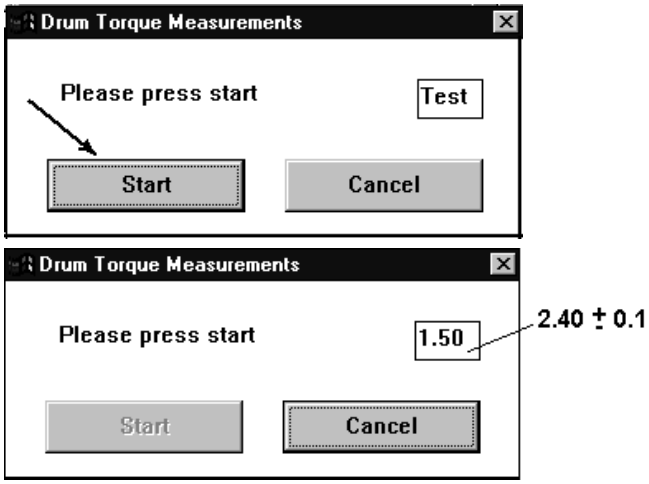


Figure 10

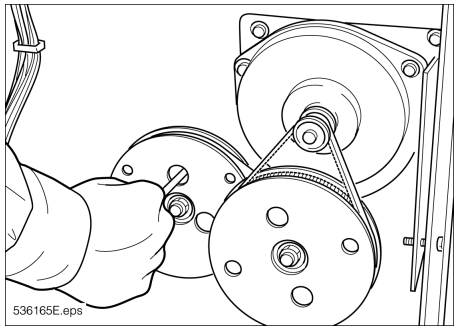


Figure 11

Note: Block the belt pulley by means of a screwdriver.

- Press CANCEL to leave the adjustment screen.
- Tighten the 4 screws to fix the position of the stiffening plate.

2.4.4 Flat belt guide

Prior to the adjustment and also during the adjustment of the belt guide check if the belt on the belt pulley runs off towards the outside or towards the inside. This mist be checked while the drum motor (M1) runs at printing speed. The guide is adjusted by means of the adjusting screw at the bearing bush inside the machine (track adjustment) (see Figure 3).
During the adjustment of the flat belt track the belt tension may be influenced. Therefore we recommend to do this adjustment step by step and always check the belt tension in-between to make sure it remains constant (correct).

For the adjustment proceed as follows:

- Loosen the 4 screws which fix the stiffening plate (see Figure 8).
- Start the drum motor (M1) with print speed (IMOS → Repair → Print Engine → Modules → Drum …) and check in which direction the belt runs off.
- Stop the motor again.
- Adjust the track. If the belt runs towards the outside, away from the side panel, then the track adjustment screw at the bearing bush must be turned to clockwise (see Figure 3). If the belt runs towards the inside, in the direction of the side panel, place the adjusting screw on the back of the bearing bush (not visible in Figure 8) and turn it clockwise.
- Tighten the 4 fixing screws of the stiffening plate again.
- Start the drum motor again and use a screwdriver to push the flat belt back into the middle of the belt pulley.
- Check if the track is now correct. If necessary, repeat the adjustment several times. The adjustment may be considered correct if the belt runs for approx. 5 min at a distance of approx. 1 mm of the edge of the belt pulley.
- Check if the tension of the flat belt still corresponds to the value prior to the adjustment.

2.5 Horizontal and vertical film alignment

Horizontal alignment

To position a printed image horizontally on a sheet, the sheet has to be repositioned under the TH until the correct position has been reached.

The printed image is made by the TH and the TH-position cannot be adjusted in the casting.

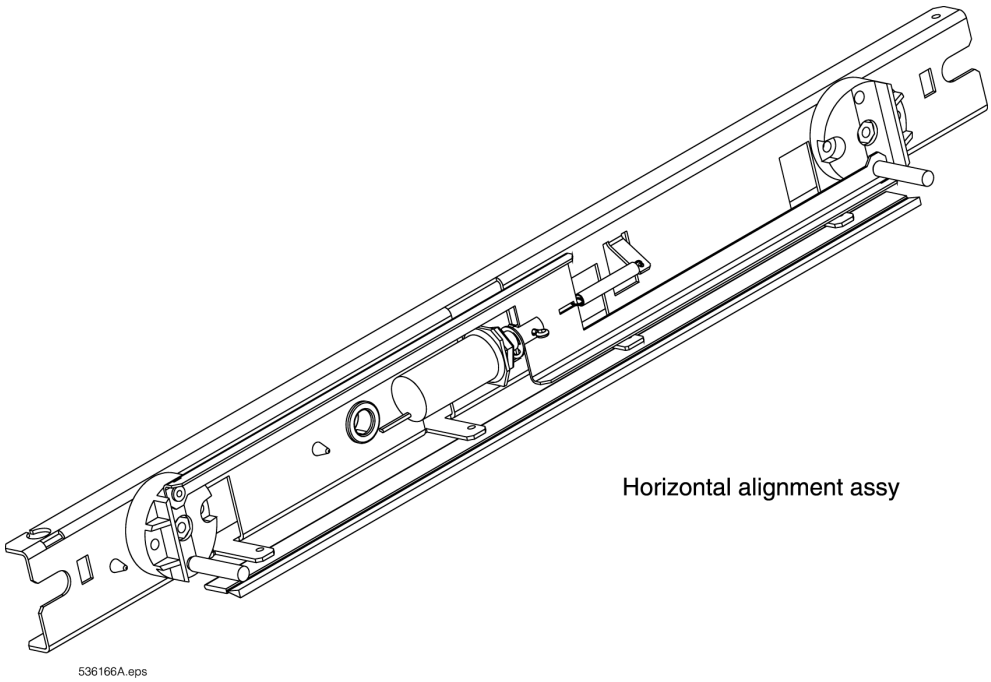


Figure 12

The displacement of the sheet under the TH can be done with the horizontal film alignment assembly. This assembly is adjustable between the two side panels of the printer.

To perform a horizontal (and vertical) alignment, a test print is needed to visualize the deviation. Before making this proof print, check the sheet feeder and put **not more than 5** sheets in the feeder. Measure the margin of the printed image at the first printed rows. Measure the left and right margin.

Calculate the difference between the measured results. Divide the result by two.

The remaining value gives the necessary displacement of the sheet to obtain a centered image on the sheet. e.g.:

- Left margin = 6,2; right margin 2,4
- Difference 6,2 - 2,4 = 3,8
- Displacement 3,8 : 2 = 1,9

The sheet has to be displaced 1,9 mm to the right in order to center the image on the sheet.

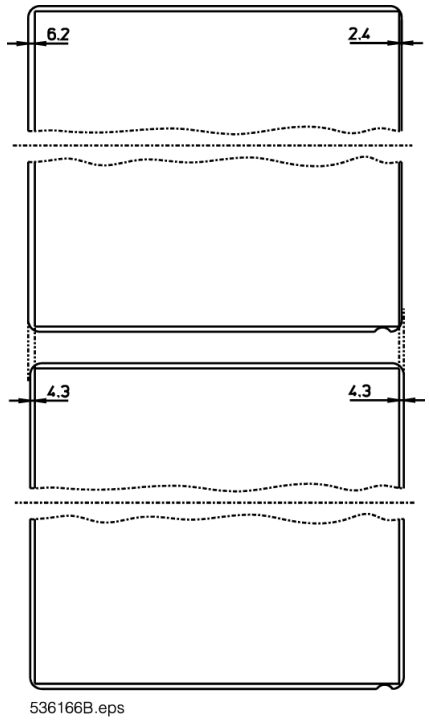


Figure 13

The notch of the sheet is at the right lower side of the printer. In this example, the sheet has to be displaced 1,9 mm to the right. This means that the alignment assembly has to be displaced 1,9 mm to the right.

Remove the side covers. To locate the adjusting screw and the securing point of the assembly on the side panels, refer to Figure 14, item 1.

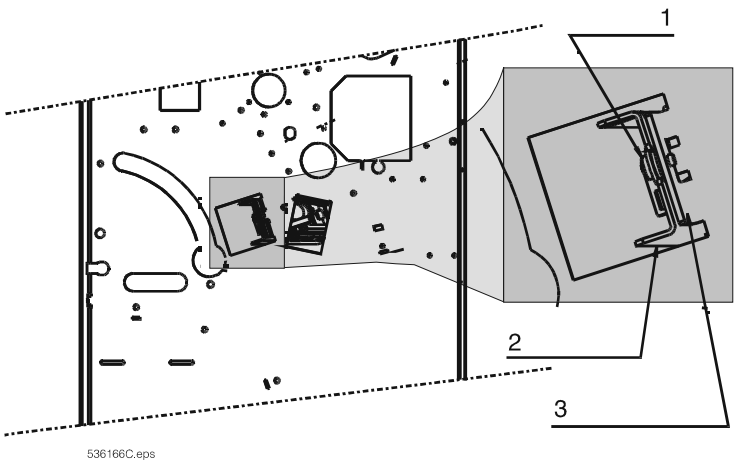


Figure 14

- First measure the distance (SGD) between the edge of the alignment assembly and the edge of the fixture with a slide gauge. E.g.:
- In the previous example the assembly had to be displaced 1,9 mm to the right. If the distance (SGD) is 2 mm (see Figure 15), the distance (SGD) after the adjustment has to be 2 - 1,9 = 0,1 mm.
- Loosen the 2 screws (see figure 8, item 1) and displace the alignment assembly to the right position.
- Tighten the 2 screws.
- Make a proof print and control the left and right margin.

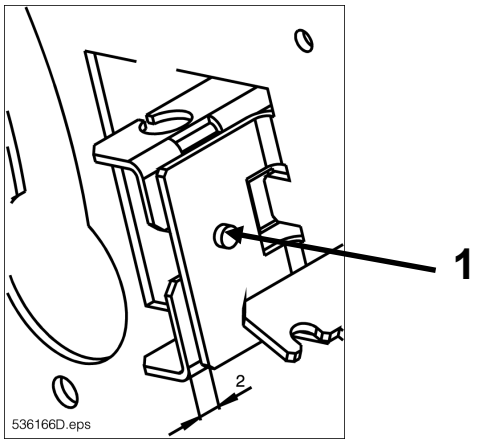


Figure 15

Vertical alignment

The adjustment mechanism which aligns the front edge of the print with the front edge of the sheet is located in the sheet feeder. This mechanism allows the displacement/rotation of the sheet edge with regard to the TH print line (see Figure 19). The adjustment can be made by means of 2 set screws (see Figure 17), which are located at the left and right side of the load system.

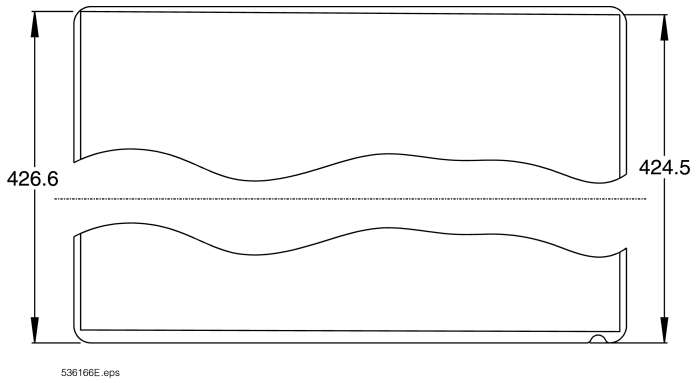


Figure 16

One turn of the set screw corresponds with a displacement of ± 0,7 mm. When turning the set screw clockwise the sheet will be adjusted upwards, the white margin at the top of the printed sheet becomes bigger. Turning counter clockwise lowers the sheet and the white margin at the top becomes smaller.

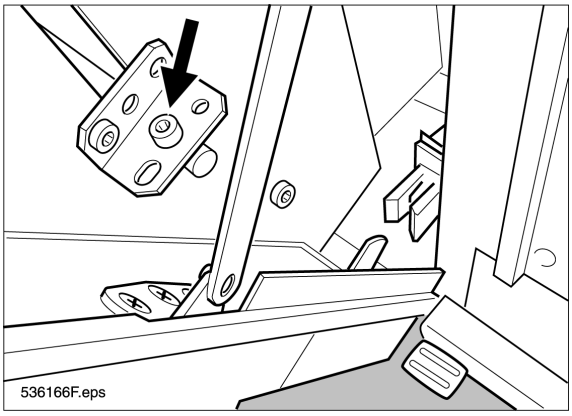


Figure 17

Normally the white top margin should be 5 mm on a normal sheet, printed from an almost empty sheet feeder. Because the real sheet length has a tolerance of ± 0,8 mm with regard to the nominal sheet length, the adjustment has to be made from the lower edge of the sheet.

Format	**Nominal length**	**Adjustment distance regarding to the lower sheet edge [mm] (see figure 9)**
14"x17"	17“ ≈ 429.7 mm	424.7 ±0.2
14"x14"	14“ ≈ 354.0 mm	349 ± 0.2
14"x11"	11“ ≈ 278.6 mm	273.6 ± 0.2

The white top margin increases with about ± 0.8 mm between a completely filled sheet feeder and an almost empty feeder, the proof print has to be made with maximum 5 sheets in the sheet feeder.

Measure the white top margin on the proof print, as well on the left as on the right side (See Figure 16)
Calculate the difference between the measured results. E.g.

- Left side 426,6 - 424,7 = 1,9 mm
- Right side 424,5 - 424,7 = -0,2 mm
- The left side must raise over 1,9 mm, so turn the left set screw CW over ± 2,7 turns.
- The right side must lower over 0,2 mm, so turn the right set screw CCW over ± 0,3 turns.
- Make a proof print and check the top margin.

2.6 Changing the film size

- Open the film loading assembly.
- Remove the remaining film.
- Loosen the screw (2) on both sides of the film loading assembly as indicated on Figure 18.

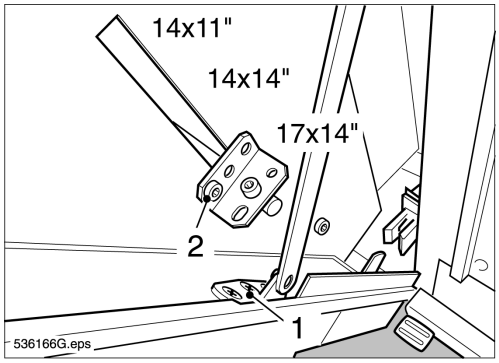


Figure 18

- Slide both sides parallel and smoothly into the new position in order to keep the plastic hooks (see Figure 19) horizontal. It is possible that the shaft between the stops falls down if the assembly is not moved horizontally. In that case the cover has to be removed in order to reinstall the shaft.

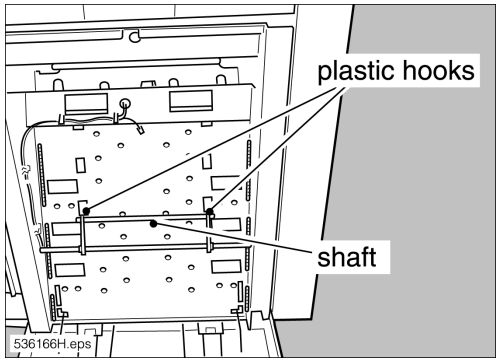


Figure 19

- Remove the three screws of the slide bar on the left and right side of the cover. (See 1 on Figure 18)
- Take care that the film loading assembly doesn't fall but bring it gently into horizontal position. Don't put any weight on the film loading assembly as it is only hold by the hinges.
- Remove the cable to sensor S4.
- Loosen the three screws that fix the 3 pins onto the pressure plate. The position of these pins depends on the installed film size. (See Figure 21)
- Remove the pressure plate.
- Loosen the two Allen screws (2,5 mm) on each of the positioning brackets and put them in the new position (Figure 20)

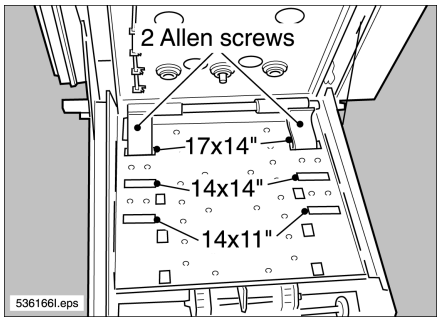


Figure 20

- Position the spring holders, pins and springs for the new film format on the pressure plate according to Figure 21.

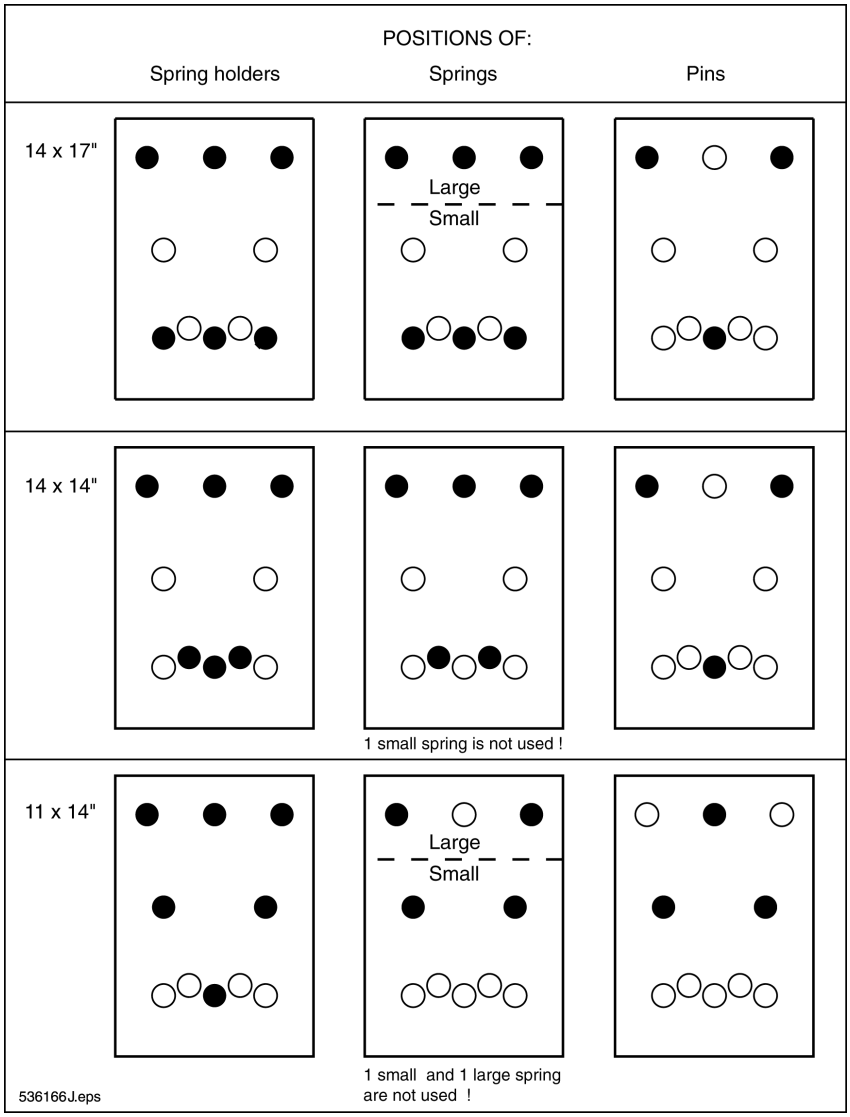

POSITIONS OF:
Spring holders
Springs
Pins
14 x 17"
Large
Small
14 x 14"
1 small spring is not used !
11 x 14"
Large
Small
1 small and 1 large spring
are not used !
536166J.eps

Figure 21

Remarks:

⇒ The spring holder can be removed by pushing it from the rear to the front side. On the rear side 3 clips should be pushed towards the center.

⇒ For the 14x14” one small spring is not used and for the 14x11” one small and one large spring are not used. Keep them in a safe place in case you need them again.

- Install the pressure plate to the rear plate by fixing the three screws in the pins
- Connect the cable sensor S4.
- Fix the sliding bars on each side with the three screws.
- Use the IMOS service software: Install → defaults and click “Client” and the appropriate film format to install the correct parameters.
- Print a test film and check if the vertical alignment is correct and align it if necessary (See Horizontal and vertical film alignment).

2.7 Thermal head pressure adjustment

Note: this adjustment has to be carried out after replacement or dismounting the TH Cam assembly

Before carrying out the pressure adjustment the Drystar must be placed in its start-up condition:

- acceptor film fed in,
- separation and outlining completed,
- thermal head in home position (completely backwards),
- pressure rollers on the drum in home position (completely backwards).

In order to have easy access to the components, the left and right cover and the rear panel must be removed.

The following tools and accessories are needed to carry out the adjustment:

- crosshead screwdriver Philips size 2 (length approx. 200 mm),
- spanner size 10,

and the **tool kit EB+53611750**

- 2 x synthetic ring,
- 2 x bolt with wing nut,
- 2 x pin,
- 2 x steel cable,
- 2 x dynamometer 0 -10 kg,
- 2 x adapter with deep groove ball bearing,
- seal wax

When the machine is in start-up condition and the covers and panels are removed, start assembling and installing the two measuring tools (one on each side of the machine). Proceed as follows (see Figure 22):

- place the synthetic ring in the hole on top of the main side plate,
- insert the bolt in the ring and fix it with the wing nut, make sure that the bolt is screwed down as far as possible,
- fix the dynamometer to the bolt,
- screw the pin into the threaded stud on the aluminum casting element which appears through the opening in the main side plate,

From now on it is impossible to open the thermal head compartment.

- screw the adapter with the deep groove ball bearing into the threaded hole provided on the main side plate approx. 4 cm from the threaded stud (to the rear),
- take the steel cable, attach it to the pin, guide it in the deep groove ball bearing and hook it on the dynamometer,

- install the same measuring tool on the other side of the Drystar.

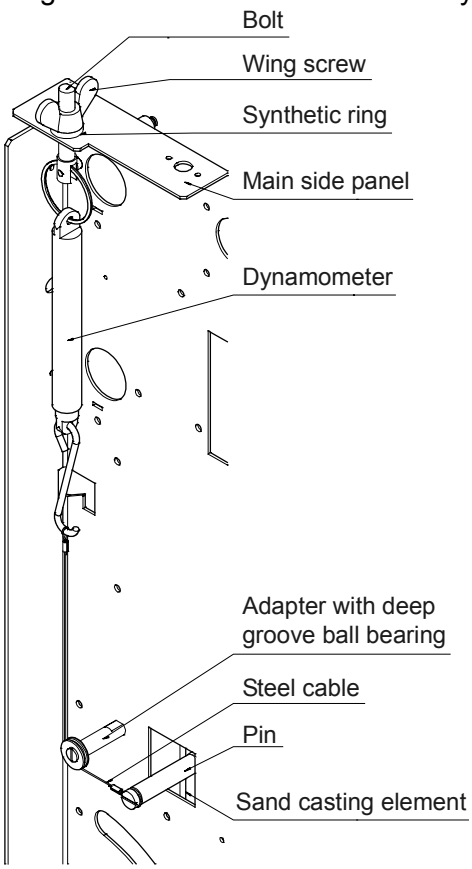


Figure 22

The Drystar is now ready for adjustment, proceed as follows:

- put the thermal head in pre-print position, (refer to the IMOS - menu: Repair -> Printengine -> Modules -> Printhead)

*In IMOS Drystar 3000 version 2.19 the motor can not be controlled due to a software error

Cure:

1) Open a terminal window (IMOS → tools → terminal).

2) As shown in Figure 24 enter the commands "can", "m3" and "3". Then the motor drives into the "preprint position".

```
dradi3_1_C:\> can

CAN_C:/->m3
   0. Off
   1. On
   2. Home
   3. Preprint
   4. Print
   choice (0 - 4) -> 2
CAN_C:/->3

CAN_C:/->
```

Figure 23

- check that the thermal head touches the inserted film. Tap with your finger tops on the aluminum casting element, to check that the aluminum casting element does not move. It is possible to access the rear of the aluminum casting element when the rear panel of the Drystar is removed,
- start turning both wing screws alternatively and clockwise so that the dynamometers pull the thermal head away from the drum. Tap with your finger tops on the rear of the aluminum casting element to determine the exact point where the thermal head detaches from the drum. As soon as the thermal head detaches, the casting element will swing slightly on its springs,
- read the thermal head pressure on the dynamometers. The optimum pressure is 5.3 kg on each side ± 5%. It is important that both dynamometers read the same value,

  adjust and equilibrate the pressure on both sides of the thermal head. Turn the M6 screws provided under the hand grip at the rear with the cross head screwdriver, clockwise to increase the pressure, and anti-clockwise to decrease the pressure.

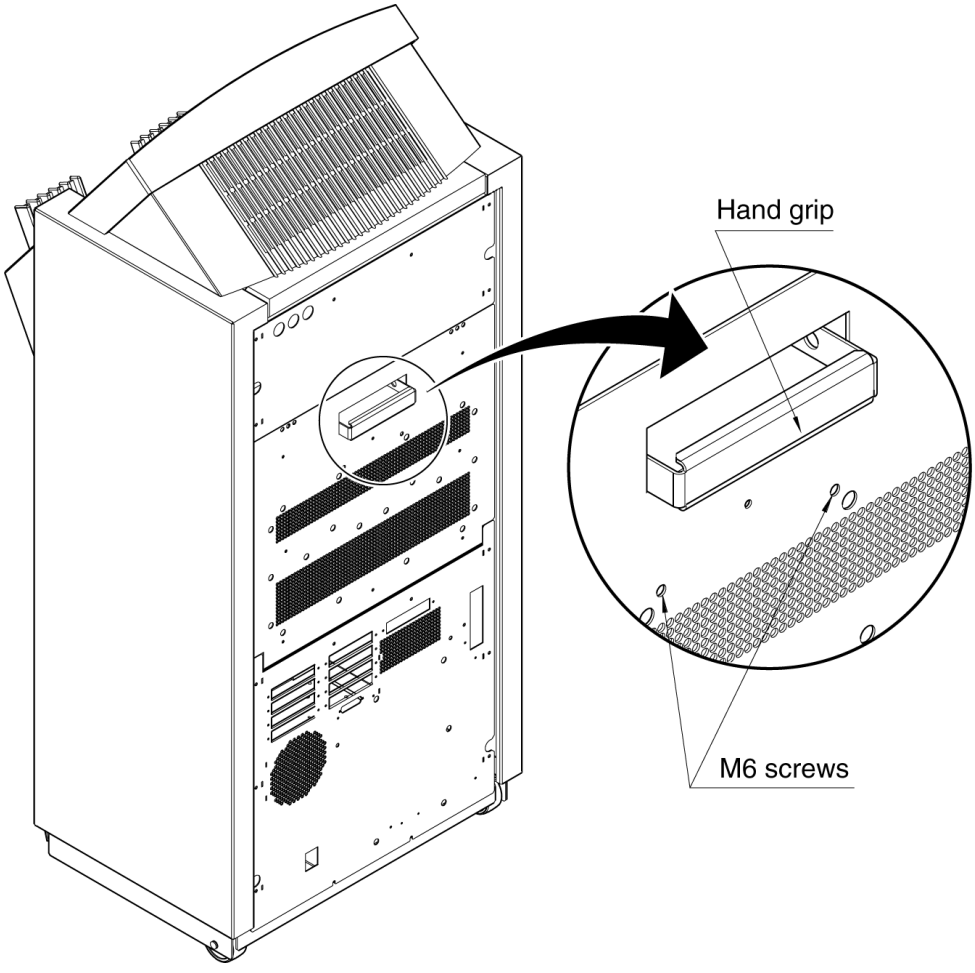


Figure 24

- remove the measuring tools and secure the M6 adjusting screws. Tighten up the lock nut M6 against the hinge plate and secure it with seal wax.
  To avoid the adjusting nut from moving when tightening the lock nut, retain it with the cross head screwdriver. To do this it is necessary to open first the hinged part of the thermal head and put the thermal head back in pre-print position. (refer to the IMOS - menu: Repair -> Printengine -> Modules -> Printhead)*

*In IMOS Drystar 3000 version 2.19 the motor can not be controlled due to a software error

Cure:

1) Open a terminal window (IMOS → tools → terminal).

2) As shown in Figure 24 enter the commands "can", "m3" and "2". Then the motor drives into the "home position".

```
dradi3_1_C:\> can

CAN_C:/->m3
   0. Off
   1. On
   2. Home
   3. Preprint
   4. Print
   choice (0 - 4) -> 2
CAN_C:/->3

CAN_C:/->
```

Figure 25

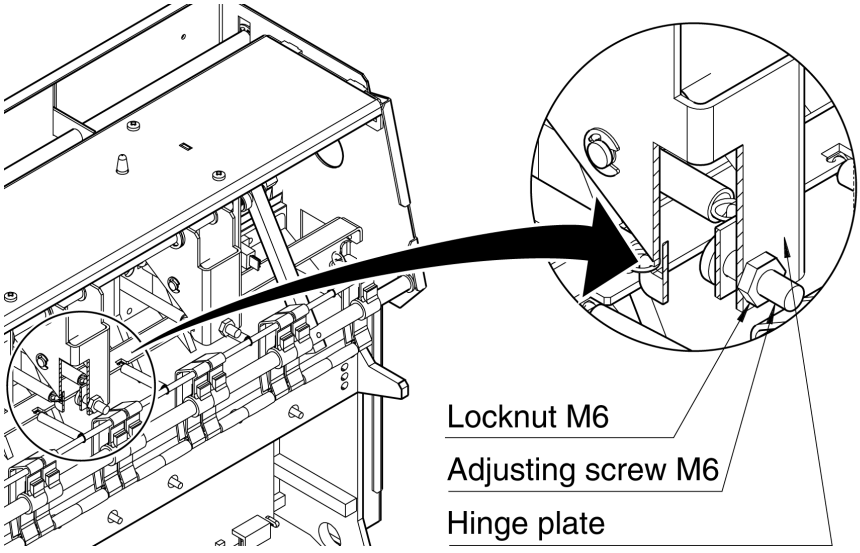


Figure 26

3 Calibrations

The calibrations procedures in SW Rel. 1.7X and 1.9X differ in details. The two tables below list these differences. They also show, where to find detailed information to the calibration.

3.1 Overview of calibrations and related procedures SW Rel. 1.7X

PROCEDURE / CALIBRATION	DESCRIPTION	AUTO-MATIC	DEFAULT	CONFIRM START BY OPERATOR	CONFIG BY OPERATOR	CONFIG BY SERVICE via NVE	DEFAULT	MANUAL START BY OPERATOR	MANUAL START BY SERVICE via IMOS	refer to section
TH Profile	Correct the thermal head profile	No						Yes	Yes	3.7
Film sensito	Correct for the sensitometry of the film	No						Yes	Yes	3.9
Maximum density	Set the Dmax to default (=3.0)	No						Yes	Yes	3.8
Film to film	Correct for density drift	Yes	ON	No	No	ON/OFF (4)	Off	No	No	
Registration	Reduces mechanical mis-registration of the MDM	No						Yes	Yes	3.4
Reference film	Determines new reference values for the MDM	No						Yes	Yes	3.5
Density Meter	Calibrate MDM sensitivity	No						Yes	Yes	3.6

3.2 Overview of calibrations and related procedures SW Rel. 1.9X

PROCEDURE / CALIBRATION	DESCRIPTION	AUTO-MATIC	DEFAULT	CONFIRM START BY OPERATOR	CONFIG BY OPERATOR	CONFIG BY SERVICE via NVE	DEFAULT	MANUAL START BY OPERATOR	MANUAL START BY SERVICE via IMOS	refer to section
Clean TH *	Stop printing to allow cleaning of TH	Display Warning	1000 films		No	ON/OFF/NUM (1)	On	Yes	No	
TH profile	Correct the thermal head profile	Display Warning	5000 films		No	ON/OFF/NUM (2)	On	Yes	Yes	3.7
Film sensito	Correct for the sensitometry of the film	Yes	New film pack (100 films)	No	ON/OFF	ON/OFF (3)	On	Yes	Yes	3.9
Film to film	Correct for density drift	Yes	OFF	No	ON/OFF	ON/OFF (4)	Off	No	No	
Registration	Reduces mechanical mis-registration of the MDM	No						No	Yes	3.4
Reference	Determines new reference values for the MDM	No						No	Yes	3.5
MDM	Calibrate MDM sensitivity	No						No	Yes	3.6

(1) DR3XXX11 parameter 'th_clean_print'. Period for automatic 'TH cleaning' message is expressed in a number of print-outs. Entering zero ('0') disables this message. Default 1000.
(2) DR3XXX11 parameter 'th_profile_prin': Period for automatic 'TH profile calibration' message is expressed in a number of print-outs. Entering zero ('0') disables this (semi-) automatic calibration. Default 5000.
(3) DR3XXX11 parameter 'sensito_mode'. Enables/Disables the automatic sensitometric calibration in case a new film package is inserted after 'empty magazine' message. Entering zero ('0') disables this automatic calibration. Default 1 (enabled).
(4) DR3XXX11 parameter 'edge_scan': When set to '1', this enables the 'film to film calibration', when set to '0' disables the 'film to film calibration'. Default 1 for SW 1.7X and 0 for SW 1.9X

*When message 'need TH cleaning' appears on the local display after 1000 printed films the customer has to do the TH cleaning procedure via the local keypad (menu 5: calibration - 3: cleaning TH) as described in reference user manual page 116. Just opening the TH door and clean the TH (without entering the 'clean TH' menu) will not reset the message.

3.3 Overview of keypad and IMOS service software calibration menus in SW Rel. 1.7X and 1.9X

The three figures enclosed show where to find the calibrations on the local keypad and in IMOS Drystar 3000 (rev. ≥ 2.19). The table enclosed explains the different calibration sub-menus.

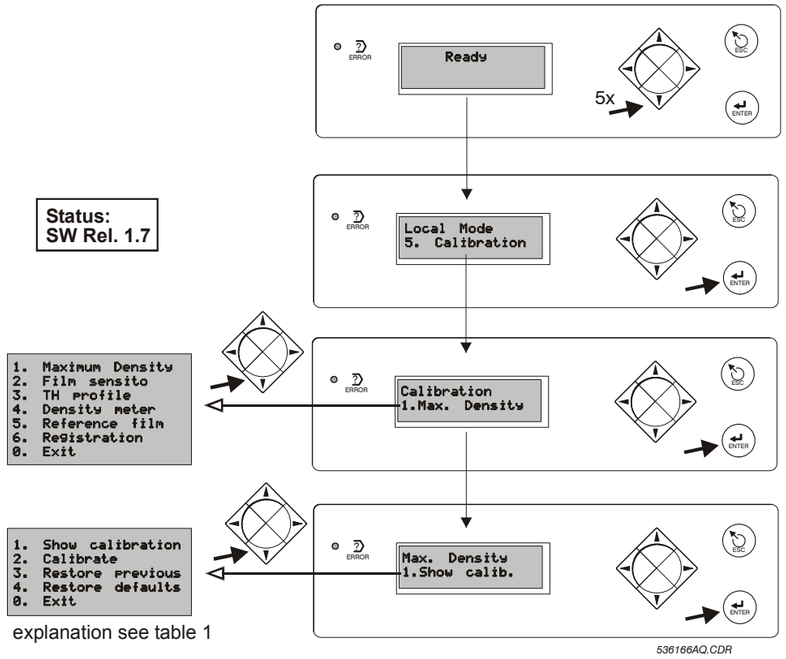


Figure 27: Calibrations at local keypad with SW Rel. 1.7X

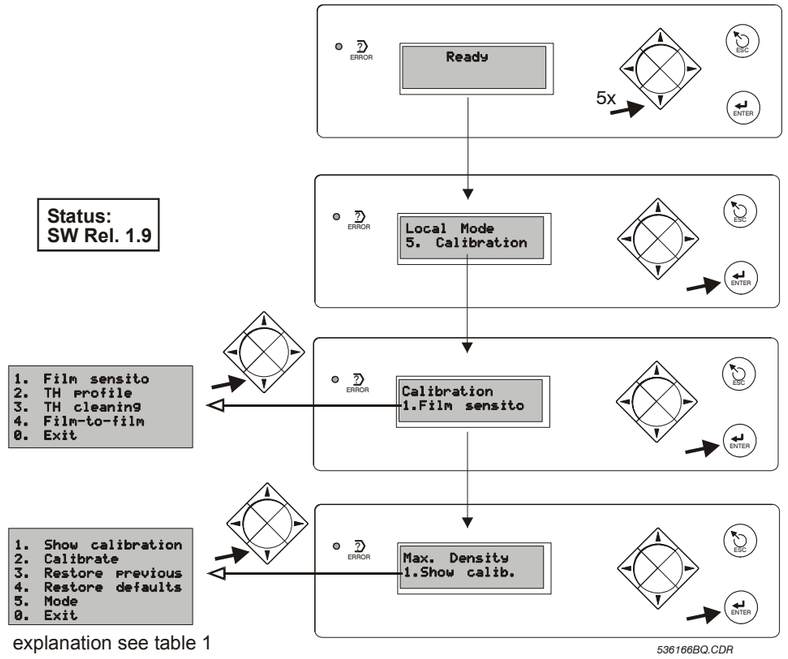


Figure 28: Calibrations at local keypad with SW Rel. 1.9X

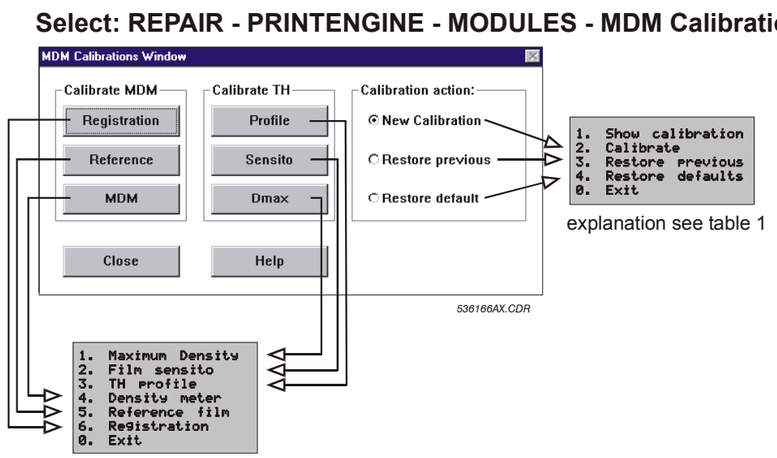


Figure 29: Calibrations via IMOS Drystar 3000

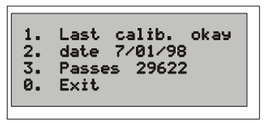
Menu	Description
1. Show calibration 	• Show the status of the current calibration: "Last calibration okay" or "Calibration disabled" or "Default calibration" (= defaults used) • Date of last calibration • Number of passes since last calibration
2. Calibrate	• Carry out the selected calibration.
3. Restore previous	• Restore the previous calibration data of the selected calibration. A backup of these data is always stored on the C: partition of the hard disk.
4. Restore defaults	• Restore the default calibration data of the selected calibration. The default calibration data are always stored on the C: partition of the hard disk.
5. Mode	• Change the calibration mode (manual or automatic). Only available as of SW Rel. 1.9X
6. Exit	• Exit this menu

Table 1

3.4 Registration Calibration

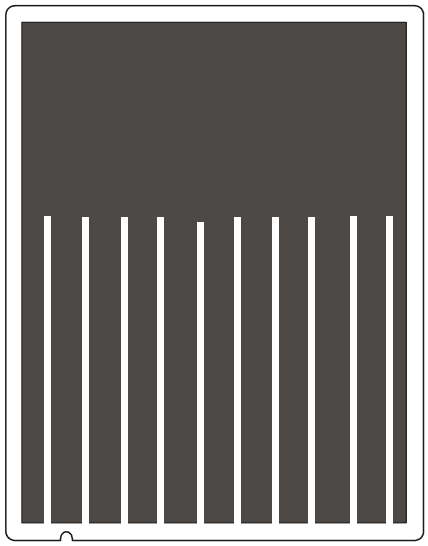
In this section the prerequisite, the procedure and the corresponding test image for the function "registration calibration" is described.

For more information where to find the function at the local keypad or in IMOS refer to page 28.

For more information to the purpose and when to be performed refer to section 5, Macrodensitometer film calibrations.

With SW Rel. 1.9X the menu **'Registration calibration'** is not offered anymore at the local keypad.

To find out the installed software, select on the local keypad menu '4. Printer Info - 3. Software Version'.

Prerequisite	How to carry out	Test image printed
• SW rel. 1.6 or higher has to be installed. • Blue or clear base film has to be inserted.	(1) Select "registration calibration" as described on page 28. (2) Select "Calibrate". (3) Wait for approx. 3 minutes. Now the test film (see beneath) is printed and measured by the MDM. The calibration data are automatically processed. (4) At message "completed" press "ESC" to get back to the previous menu.	

3.5 Reference Film Calibration

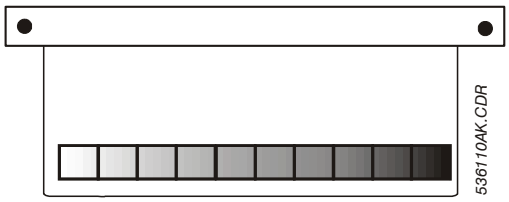
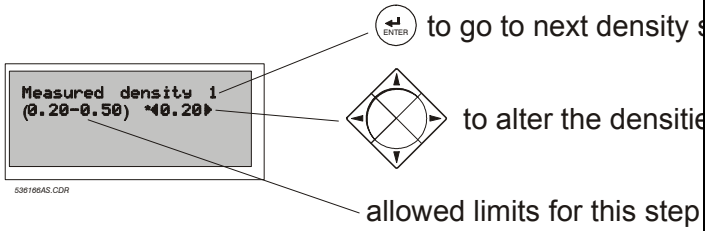
In this section the prerequisite and the procedure for the function "reference film" is described.

For more information where to find the function at the local keypad or in IMOS refer to page 28.

For more information to the purpose and when to be performed refer to section 5, Macrodensitometer film calibrations.

With SW Rel. 1.9X the menu **'Reference film'** is not offered anymore at the local keypad.

To find out the installed software, select on the local keypad menu '4. Printer Info - 3. Software Version'.

Prerequisite	How to carry out	Test image printed
• SW rel. 1.6. or higher has to be installed. • Blue or clear base film has to be inserted. • An external densitometer for measurement is needed. • The MDM calibration film (inside left printer panel) is needed.	(1) Measure and note down the density of the 22 different squares on the MDM calibration film.  (2) Select "reference film" as described on page 28. (3) Select "Calibrate". (4) Select "Change density" (i.e. press ENTER at the local keypad). (5) With the arrow key alter the densities as just measured. With the enter key go to next density.  (6) At message "completed" press "ESC" to get back to the previous menu.	none

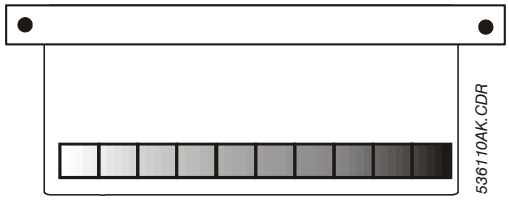
3.6 Density Meter Calibration

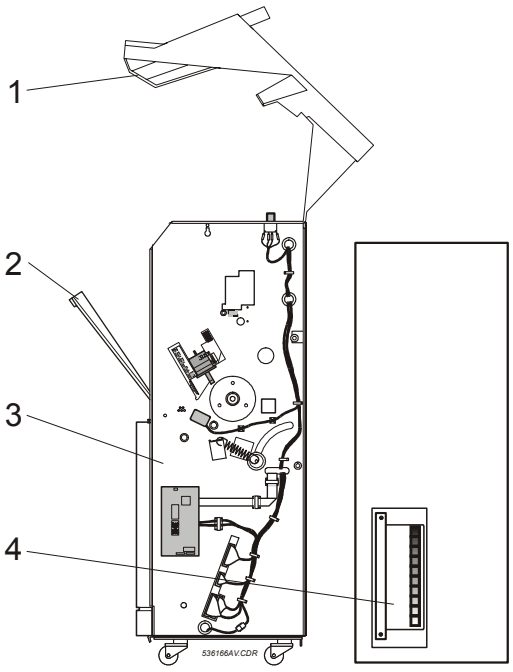
In this section the prerequisite and the procedure for the function "Density meter" is described.

For more information where to find the function at the local keypad or in IMOS refer to page 28.

For more information to the purpose and when to be performed refer to section 5, Macrodensitometer film calibrations.

With SW Rel. 1.9X the menu **'Density Meter Calibration '** is not offered anymore at the local keypad.
To find out the installed software, select on the local keypad menu '4. Printer Info - 3. Software Version'.

Prerequisite	How to carry out	Test image printed
• SW rel. 1.6. or higher has to be installed. • Blue or clear base film has to be inserted. • The MDM calibration film (inside left printer panel) is needed.	(1) Insert the film as described in Figure 30: Preparations for MDM calibration film insertion and Figure 31: Correct insertion of MDM calibration film  (2) Select "density meter" as described on page 28. (3) Select "Calibrate". (4) At message "completed" press "ESC" to get back to the previous menu. (5) Remove the calibration film.	none



Preparations for MDM calibration film insertion
(1) open top cover
(2) open lid
(3) remove left and right panel
(4) get MDM calibration film (located in the left panel)

Figure 30: Preparations for MDM calibration film insertion

Correct insertion of MDM calibration film:

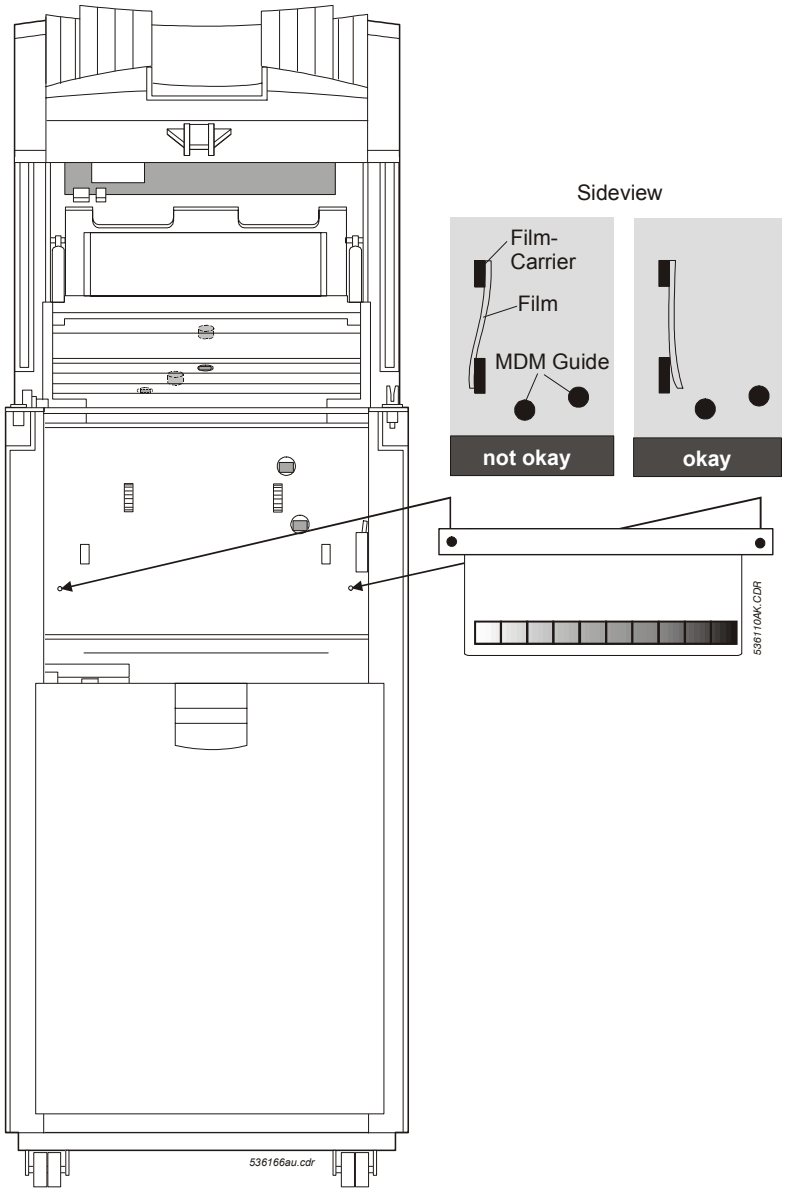


Figure 31: Correct insertion of MDM calibration film

All covers have to be closed before the calibration is started.
Daylight influences the measurement.

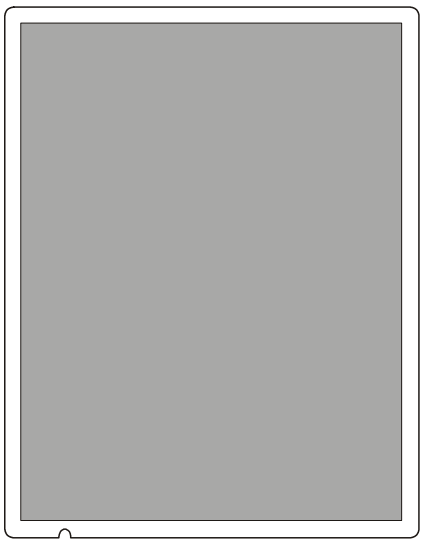
3.7 TH profile calibration

In this section the prerequisite and the procedure for the function "TH profile" is described.

For more information where to find the function at the local keypad or in IMOS refer to page 28.

For more information to the purpose and when to be performed refer to section 5, Macrodensitometer film calibrations.

It is recommended to clean the TH before this procedure. Refer to section 12, maintenance instructions.

Prerequisite	How to carry out	Test image printed
• SW rel. 1.6. or higher has to be installed. • Blue or clear base film has to be inserted. • Registration calibration has to be performed before (refer to section 3.4, page 29).	(1) Select "TH profile" as described on page 28. (2) Select "Calibrate". (3) Wait for approx. 3 minutes. Now the test film (see beneath) is printed and measured by the MDM. The calibration data are automatically processed. (4) Check the printed film for dust artifacts at the bottom side (lower 3 cm). In case of dust artifacts the measurement was wrong and has to be repeated. (5) At message "completed" press "ESC" a few times to get out of the user menu. (6) Print a flatfield: IMOS Drystar 3000: "Repair → PrintEngine → Print Testpage → flat001.bla (7) In case the flatfield shows acceptable uniformity the calibration is finished. Otherwise repeat the TH profile calibration up to 2 times.	

3.8 Maximum density calibration

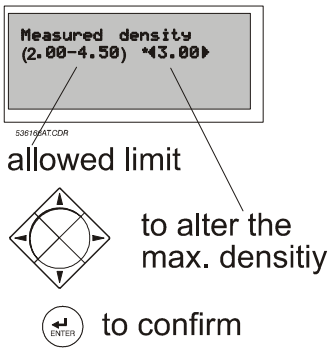
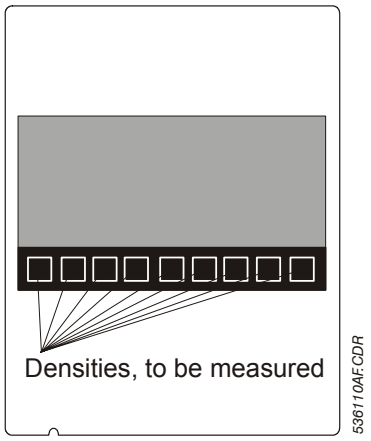
In this section the prerequisite and the procedure for the function "Maximum density" is described.

For more information to where to find the function at the local keypad or in IMOS refer to page 28.

For more information to the purpose and when to be performed refer to section 5, Macrodensitometer film calibrations.

With SW Rel. 1.9X the menu **'Maximum Density'** is not offered anymore at the local keypad. In SW Rel. 1.9X it is part of the 'Film sensito' calibration.

To find out the installed software, select on the local keypad menu '4. Printer Info - 3. Software Version'.

Prerequisite	How to carry out	Test image printed
• SW rel. 1.6. or higher has to be installed. • An external densitometer for measurement is needed.	(1) Select "Maximum density" as described on page 28. (2) Select "Calibrate". (3) Wait for approx. 1 minute. Now the test film (see beneath) is printed. (4) Measure the densities of the 9 squares, and enter the **lowest** one. (5) In case the max. density variations of the test film are > 0.2 O.D., perform a TH profile calibration first. Refer to section 3.7 page 33. Otherwise proceed as described here.  (6) Select Enter to confirm (7) At message "completed" press "ESC" a few times to get out of the user menu. (8) Now print a SMPTE test image and check the image quality. Refer to 3.8.1 next page.	

3.8.1 Print SMPTE Testimage

- After Maximum Density Calibration print an SMPTE test image for to check the printer calibrations:

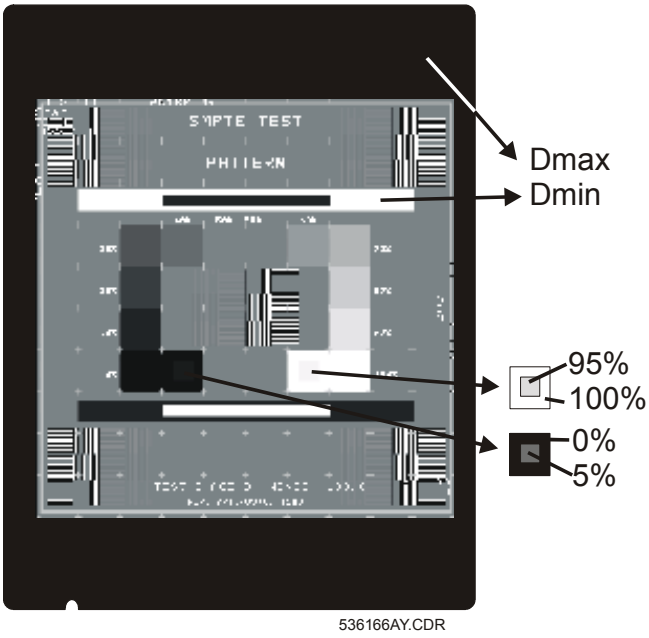


Figure 32: Check SMPTE test image

- Check Dmax. It has to be 3.0 ± 0.2 O.D. If outside limits, print 4 more films, and measure the 5th again. At huge deviations up to 5 films are necessary to adapt the TH power for Dmax of 3.0 O.D. If still outside limits refer to section 6.3, Troubleshooting, symptom "Dmax too high or too low".
- Check Dmin: It has to be 0.2 ± 0.07 O.D. If outside limits refer to section 6.3 Troubleshooting, symptom "Dmin too high".
- Check fields 5/0% and 95/100%. The difference must be visible. If not, a sensito calibration has to be performed. Refer to section 3.9 page 36.

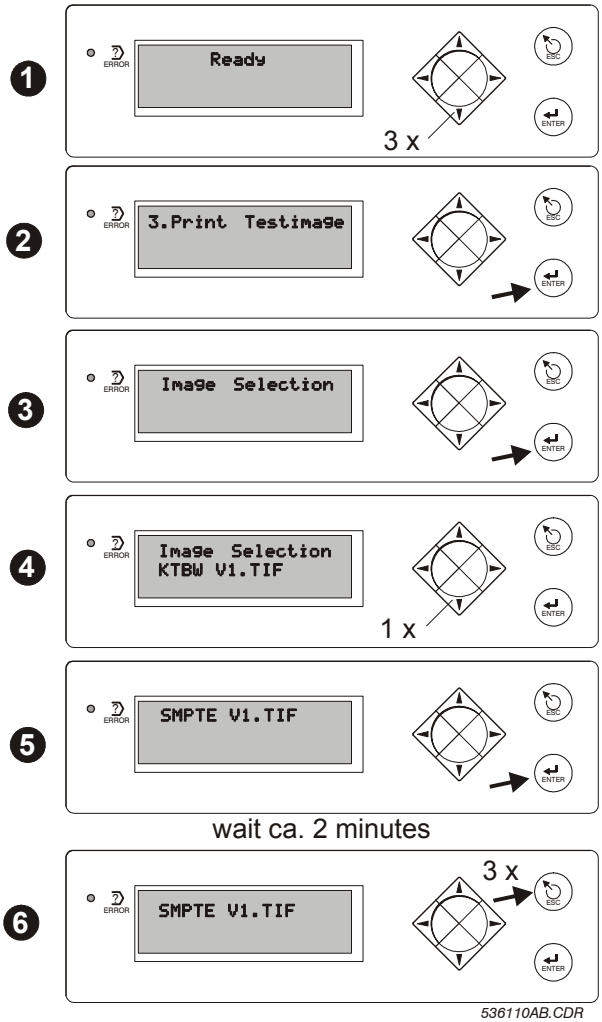


Figure 33: Print SMPTE testimage at the local keypad.

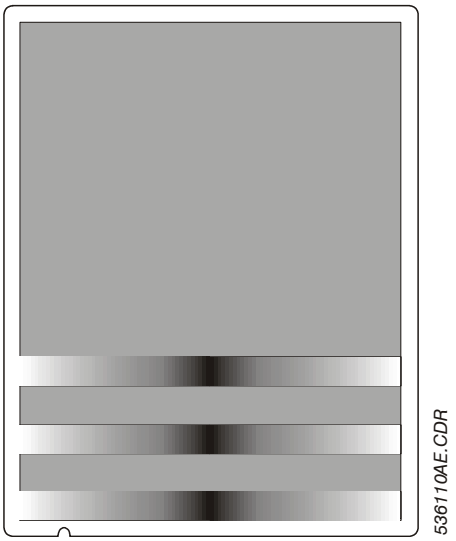
3.9 Film Sensito Calibration

In this section the prerequisite and the procedure for the function "Film sensito" is described.
For more information to where to find the function at the local keypad or in IMOS refer to page 28.

For more information to the purpose and when to be performed refer to section 5, Macrodensitometer film calibrations.

With SW Rel. 1.9X the function **'Film Sensito Calibration'** includes the Dmax calibration.

To find out the installed software, select on the local keypad menu '4. Printer Info - 3. Software Version'.

Prerequisite	How to carry out	Testimage printed
• SW rel. 1.6. or higher has to be installed. • Blue or clear base film has to be inserted. • Dmax has to be in the range of 3.0 ± 0.2 O.D.	(1) Select "Film Sensito" as described on page 28. (2) Select "Calibrate". (3) Wait for approx. 3 minute. Now the test film (see beneath) is printed and automatically measured. (4) At message "completed" press "ESC" to get back to the previous menu.	

Note for sensito calibration with SW Rel. 1.9X:

In case the reached Dmax level after a film sensito calibration is below the target Dmax (target Dmax = 3.10), a warning message is displayed 'Dmax= X.YZ'.
In this case a new film sensito calibration is recommended. In case the target Dmax cannot be reached, printing can continue nevertheless.